Goal 1: Clean Air

The air in every American community will be safe and healthy to breathe. In particular, children, the elderly, and people with respiratory aliments will be protected from health risks of breathing polluted air. Reducing air pollution will also protect the environment, resulting in many benefits, such as restoring life in damaged ecosystems and reducing health risks to those whose subsistence depends directly on those ecosystems.

Background and Context

The average American breathes over 3,000 gallons of air each day. Air pollution contributes to illnesses such as cancer and to respiratory, developmental, and reproductive problems. Children are at greater risk because they are more active outdoors and their lungs are still developing. The elderly also are more sensitive to air pollution because they often have heart or lung disease.

Certain pollutants (such as some metals and organic chemicals) that are emitted from industrial and other sources can be deposited into water bodies and magnified through the food web, adversely affecting fish-eating animals and humans. Currently, about 2,500 water bodies are under fish consumption advisories resulting from chemicals such as PCBs, chlordane, dioxins and mercury. Air pollution also makes soil and waterways more acidic, reduces visibility, and accelerates corrosion of buildings and monuments.

The air pollution problem is national and international in scope. Air pollution regularly crosses local and state lines and, in some cases, crosses our borders with Canada and Mexico. This causes problems not only for the majority of the population who live in expanding urban areas, but also for less populated areas and national parks. Federal assistance and leadership are essential for developing and implementing cooperative state, local, Tribal, regional, and international programs to prevent and control air pollution; for ensuring that national standards are met; and for providing tools for states, Tribes, and local communities to use in preparing their clean air plans.

Criteria pollutants. To protect public health and the environment, EPA develops standards that limit concentrations of six widespread pollutants (known as criteria pollutants) that are linked to many serious health and environmental problems:

- Ground-level ozone (smog). Ozone can irritate and inflame airways. Health effects attributed to exposures to ozone, generally while individuals are engaged in moderate or heavy exertion, include significant decreases in lung function and increased respiratory symptoms such as chest pain and cough. Exposures to ozone result in lung inflammation, aggravate respiratory diseases such as asthma and may make people more susceptible to respiratory infection. Children active outdoors are most at risk of experiencing such effects. Other at-risk groups include adults who are active outdoors such as outdoor workers and individuals with respiratory disorders such as asthma. Ground-level ozone interferes with the ability of plants to produce and store food, which reduces crop and forest yields by making plants more susceptible to disease, insects, other pollutants and harsh weather. It damages the leaves of trees and other plants, affecting the appearance of cities, national parks and recreation areas.

- Sulfur dioxide (SO_2). Peak levels of SO_2 can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposure to a combination of SO_2 and fine particles can cause respiratory illness, alter the defense mechanisms of lungs, and aggravate cardiopulmonary disease. People who may be most susceptible to these effects include individuals with cardiovascular disease or chronic lung disease, as well as children and the elderly. SO_2 is also a major contributor to acidic deposition.

- Nitrogen dioxide (NO_2). Exposure to NO_2 causes respiratory symptoms such as coughing, wheezing, and shortness of breath in children and adults with respiratory diseases, such as asthma. Even short exposures to NO_2 affect lung function. NO_2 also contributes to acidic deposition, eutrophication in coastal waters, and visibility problems.

- Carbon monoxide (CO). The health threat from lower levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise. Even healthy people can be affected by high levels of CO. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks.

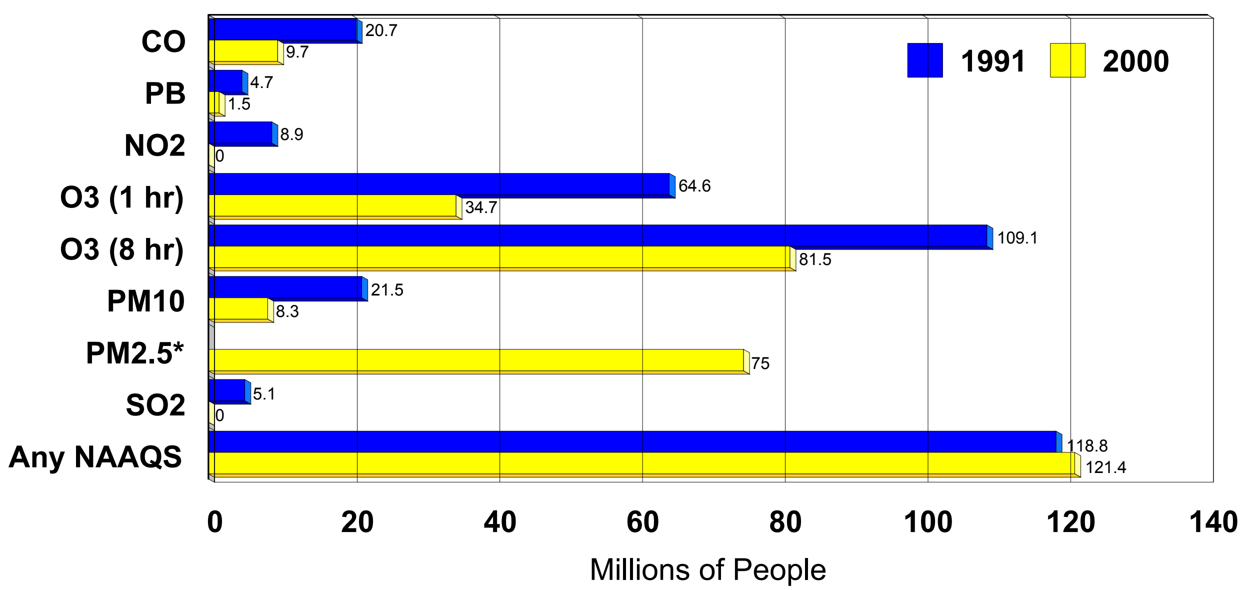
- Lead. Lead causes damage to the kidneys, liver, brain and nerves, and other organs. Excessive exposure to lead causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes. Low levels of lead damage the brain and nerves in fetuses and young children, resulting in learning deficits and lowered IQ.

- Particulate matter (PM). PM causes a wide variety of health and environmental problems. When exposed to PM, people with existing lung or heart diseases - such as asthma, chronic obstructive pulmonary disease, congestive heart disease, or coronary artery disease - are at increased risk of health problems requiring hospitalization or of premature death. When exposed to PM, children

- and people with existing lung disease may not be able to breathe as deeply or vigorously as they normally would and they may experience

- symptoms such as coughing and shortness of breath. PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis, causing more use of medication and more doctor visits. PM is also the major cause of reduced visibility in parts of the U.S., including many of our national parks. Particles can be carried over long distances by wind and then settle on ground or water. The effects of this settling include: making lakes and streams acidic, changing the nutrient balance in coastal waters and large river basins, depleting the nutrients in soil, damaging sensitive forests and farm crops, and decreasing the diversity of ecosystems.

Populations of Counties with Air Quality Concentrations Above the NAAQS Level



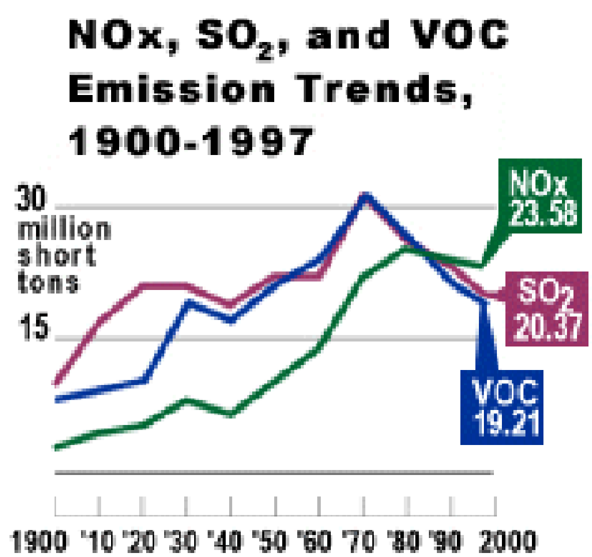
Hazardous air pollutants. Hazardous air pollutants (HAPs), commonly referred to as air toxics, are pollutants that are known or suspected to cause cancer or other serious health problems, such as reproductive effects or birth defects, or adverse environmental effects. EPA is working with state, local, and Tribal governments to reduce air releases of 188 pollutants listed in the Clean Air Act Amendments of 1990. Examples of air toxics include mercury and BTX. HAPs are emitted from literally thousands of sources. Adverse effects to human health and the environment due to HAPs can result from even low level exposure to air toxics from individual facilities, exposures to mixtures of pollutants found in urban settings, or exposure to pollutants emitted from distant sources that are transported through the atmosphere over regional, national, or even global airsheds.

Compared to information for the criteria pollutants, the information about the ambient concentrations of HAPs and their potential health effects is relatively incomplete. Most of the information on the potential health effects of these pollutants is derived from experimental animal data. Of the 188 HAPs, almost 60 percent are classified by the Clean Air Act (section 112.(f)(2)(A)) as known, probable, or possible carcinogens. One of the often documented ecological concerns associated with toxic air pollutants is the potential for some to damage aquatic ecosystems. Deposited air pollutants can be significant contributors to overall pollutant loadings entering water bodies.

Acid rain. Emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x) react in the atmosphere and fall to earth as acid rain, causing acidification of lakes and streams and contributing to the damage of trees at high elevations. Acid deposition also accelerates the decay of building materials and paints and contributes to degradation of irreplaceable cultural objects, such as statues and sculptures. NO_x deposition also contributes to eutrophication of coastal waters, such as the Chesapeake Bay and Tampa Bay. Before falling to earth, SO_2 and NO_x gases form fine particles that affect public health by contributing to premature mortality, chronic bronchitis, and other respiratory problems. The fine particles also contribute to reduced visibility in national parks and elsewhere.

Trends. The air in the U.S. is now the cleanest it has been during the 20 years that EPA has been tracking air quality. National air quality, measured at thousands of monitoring stations across the country, has shown improvements for all six principal pollutants: CO, lead, NO_2, SO_2, ozone, and PM. This means that during the past 20 years, Americans have been able to breathe a little easier, see a little better, and enjoy a cleaner environment. Additional steps still need to be taken, however, to bring remaining areas with unhealthful air fully into compliance with health-based air quality standards. The nation also faces a significant challenge in maintaining this historical trend of improving air quality, given expectations for future growth in the economy, the population, and highway vehicle use. In addition, ambient concentrations of many hazardous air pollutants remain high and continue to impose significant health risks on exposed individuals.

EPA tracks trends in key air pollutants through an Air Quality Index that reflects the number of days that any health-based standard is violated. As the chart shows, the percentage of days across the country that air quality violated a health standard has dropped from almost 10 percent in 1988 to 3 percent in 2000. Even on those days, the standard was generally violated only for a few hours, although these late afternoon hours tend to be when many children and adults are outside engaging in work and exercise that increases the severity of exposure to unhealthful air.



Nationwide, emissions of air toxics dropped approximately 30 percent between 1990 and 2000. For example, perchloroethylene monitored in 16 urban sites in California showed a drop of 60 percent from 1989 to 1998. Benzene, emitted from cars, trucks, oil refineries, and chemical processes, is another widely monitored toxic air pollutant. Measures taken from 84 urban monitoring sites around the country show a 39-percent drop in benzene levels from 1993 to 1998. Since implementation of EPA's acid rain program in 1995, there have been dramatic reductions (10 to 25 percent) in sulfates deposited in many the most acid sensitive ecosystems located in the Northeastern U.S.

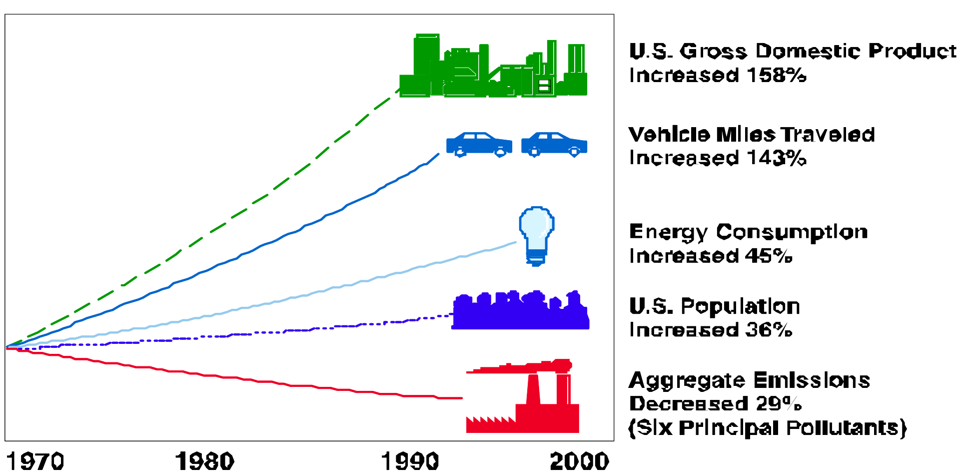
Although substantial progress has been made, it is important not to lose sight of the magnitude of the air pollution problem that still remains. Despite great progress in improving air quality, over 160 million tons of air pollution were released into the air in 2000 in the U.S. Approximately 121 million people lived in counties where monitored air was unhealthy because of high levels of the six principal air pollutants. Some national parks, including the Great Smoky Mountains and the Shenandoah, have high air pollution concentrations resulting from the transport of pollutants many miles from their original sources. In 2000, for the third consecutive year, rural 1-hour ozone (smog) levels were greater than the average levels observed for urban sites, but they are still lower than levels observed at suburban sites.

Means and Strategy

Strategy. EPA's overall goals for the air quality program include: improving air quality and addressing highest health and environmental risks, while reducing program costs; getting better results in less burdensome ways; and increasing the roles of state Tribal, and local governments. The Clean Air Act provides the principal framework for national, state, Tribal, and local efforts to protect and improve air quality and reduce risks. Under the Clean Air Act, EPA has a number of responsibilities:

- Ensuring continued protection of public health and the environment through regular review of National Ambient Air Quality Standards (NAAQSs) for the six criteria pollutants and revision of the NAAQSs, if necessary, based on the latest scientific information available.
- Ensuring that the NAAQSs are met by developing and carrying out national regulatory and non-regulatory programs that reduce air pollution from vehicles, factories, and other sources, and by working in partnership with state, Tribal, and local governments on implementing their clean air programs.
- Assessing public health risks from air toxics and reducing public exposure to pollutants that cause or may cause cancer and other adverse human health effects through pollution prevention and reduction of toxic emissions.
- Reducing acid rain through a market-based approach that provides flexibility to electric utilities and other large sources of SO_2 and NO_x in how they meet emission reduction requirements.
- Protecting and enhancing visibility across large regional areas, including many of the Nation's most treasured parks and wilderness areas, by reducing pollutants such as PM, SO_2, and NO_x.
- Providing a strong scientific basis for policy and regulatory decisions and exploring emerging problem areas through a coordinated, comprehensive research program.

Comparison of Growth Areas and Emission Trends (Between 1970 and 2000)



Between 1970 and 2000, gross domestic product increased 158 percent, energy consumption increased 45 percent, vehicle miles traveled increased 143 percent, and U.S. population increased 36 percent. At the same time, total emissions of the six principal air pollutants decreased 29 percent.

One constant across the titles of the Clean Air Act is that they all are designed to get the most cost-effective pollution reductions early on. The problems that remain are some of the most difficult to solve. EPA has developed strategies to help address this difficult increment and overcome the barriers that have hindered progress towards clean air in the past. The Agency will use flexible approaches, where possible, instead of hard-and-fast formulas or specific technology requirements. Also, the Agency will work with areas that have the worst problems to develop strategies that address unique local conditions and achieve real risk reductions that matter to communities.

- Multi-pollutant strategies. The many inter-relationships among ozone, fine PM, regional haze, and air toxics problems provide opportunities for developing integrated strategies to reduce pollutant emissions. EPA has encouraged states, Tribes, and local governments to coordinate the work they are doing to maximize the effectiveness of control strategies.

- Economic incentives. EPA has provided increased flexibility to industry through the use of economic incentives and market-based approaches. Emissions trading, averaging, and banking have become standard tools in the Agency's air programs. The acid rain program uses allowance trading and early reduction credits to cut control costs and reduce pollution faster. The Tier II and diesel programs allow manufacturers to produce a mix of vehicles that collectively meet emission reduction targets. EPA's economic incentive programs include a variety of measures designed to increase flexibility and efficiency, while maintaining the accountability and enforceability of traditional air quality management programs.

- Consensus building. In implementing the Clean Air Act, the Agency has emphasized consensus building, and broad stakeholder involvement. Examples include:

    - Working cooperatively with industry on toxics standards (e.g., the regulatory-negotiation with the coke oven industry).
    - Working with industry to implement innovative approaches (e.g., the auto industry voluntarily agreeing to meet National Low Emission Vehicle standards).
    - Meeting with the refining industry, the auto industry, and state officials to balance the many concerns in the Tier II rulemaking and promulgating a complicated and groundbreaking national program supported by a wide range of stakeholders.

- Systems approach. Tier II also is a good example of how the Agency looks at air quality problems from a broader perspective and takes advantage of the potential synergies. As catalyst technology requires low-sulfur fuel, the Agency is regulating fuels and vehicles as one system, to give pollution control manufacturers the incentive to develop even cleaner technologies. This results in a greater reduction in pollution -- at less cost -- than by addressing fuels and vehicles separately.

- Innovative technology. EPA increasingly incorporates incentives and performance-based approaches into regulations to spur new technologies that will help meet ambitious goals more cost-effectively (sometimes at even less cost than EPA has predicted). The Agency also is building partnerships that help develop and deploy these new technologies. The report prepared to meet the requirements of section 812 of the Clean Air Act includes a list of the technologies that have been developed since the 1990 Amendments. The advances have been remarkable. Technologies like SCR on power plants, ultra-low NO_x burners, or advanced catalysts now have entered the mainstream, at far less cost than anyone predicted.

Research

EPA's NAAQS-related research supports the Agency's Clean Air Goal to meet national clean air standards for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_X), lead, tropospheric ozone, and particulate matter (PM). This research provides methods, models, data, and assessment criteria on the health risks associated with these and other pollutants, alone and in combination, focusing on the exposures, health effects, mechanisms of injury, and identifying components of particulate matter (PM). In addition, this research provides NAAQS implementation tools to support efforts by industry, and state, Tribal, and local regulators, to develop and improve State Implementation Plans (SIPs) to attain the NAAQS.

Research on air toxics investigates the root causes of the environmental and human health problems in urban areas related to these pollutants. These efforts provide the necessary health effects data, measurements, methods, models, information, assessments, and technical support to EPA, state, Tribal, and local regulators to estimate human health effects and aggregate exposures to hazardous air pollutants. Research also supports atmospheric and emission modeling in order to estimate fate, ambient concentrations, and mobile source emissions of air toxics at a more refined scale. With this information the Agency will be in a better position to determine risk and develop alternative strategies for maximizing risk reductions.

External Factors

Stakeholder participation

To achieve clean air, EPA relies on the cooperation of Federal, state, Tribal, and local government agencies; industry; non-profit organizations; and individuals. Success is far from guaranteed, even with the full participation of all stakeholders. EPA has significant work to accomplish just to reach the annual targets that lead to the longer term health and environmental outcomes and improvements that are articulated in the Clean Air goal. Meeting the Clean Air goal necessitates a strong partnership among all the stakeholders, but in particular among the states, Tribes, and EPA; the Environmental Council of States; and organizations of state and local air pollution control officials. EPA will be working with various stakeholders to encourage new ways to meet the challenges of "cross regional" issues as well as to integrate programs to address airborne pollutants more holistically.

Environmental factors

In developing clean air strategies, states, Tribes, and local governments assume normal meteorological patterns. As EPA develops standards and programs to achieve the Clean Air goal, it has to consider weather as a variable in the equation for implementing standards and meeting program goals. For example, even if an area is implementing a number of air pollution control programs under normal meteorological patterns, a hot humid summer may cause an area to exceed standards for days at a time, thereby exposing the public to unhealthy air.

Litigation

In July 1997, EPA published revised, more protective NAAQSs for ozone and PM. The standards are currently under litigation. In February, 2001, the U.S. Supreme Court issued an opinion largely upholding EPA's position on several key issues related to these standards. The Supreme Court sent the case back to the U.S. Court of Appeals for the District of Columbia Circuit to address unresolved issues that challengers had raised before the D.C. Circuit. The D.C. Circuit had not addressed these issues before because it had remanded the standards to EPA based primarily on its finding that the Clean Air Act, as EPA had interpreted it, was unconstitutional -- a finding the Supreme Court has now reversed.

A decision from the D.C. Circuit on the unresolved issues related to the 1997 standards is expected in Spring 2002. Currently, EPA is evaluating the Supreme Court opinion, the opinions of the D.C. Circuit, and several legislative provisions to determine how to proceed. The Agency believes that the standards are necessary to protect public health and nothing in the decisions undercuts that belief. We are evaluating our programs to determine how best to secure necessary public health protections while still respecting the courts' decisions. This litigation does not affect standards that were in place prior to July 1997.

Resource Summary

(Dollars in Thousands)

	FY 2001 Actuals	FY 2002 Enacted	FY 2003 Request
Clean Air	**$560,547.8**	**$593,361.8**	**$597,977.3**
Attain NAAQS	**$441,056.4**	**$457,711.8**	**$458,856.3**
Environmental Program & Management	$130,946.1	$119,768.2	$118,516.4
Hazardous Substance Superfund	$0.0	$24.1	$21.5
Science & Technology	$119,599.5	$138,553.0	$146,851.9
State and Tribal Assistance Grants	$190,510.8	$199,966.5	$193,466.5
Reduce Air Toxics Risk	**$101,548.2**	**$114,658.9**	**$118,023.2**
Environmental Program & Management	$48,479.1	$56,402.2	$56,913.9
Science & Technology	$25,785.4	$27,466.3	$23,818.9
State and Tribal Assistance Grants	$27,283.7	$30,790.4	$37,290.4
Reduce Acid Rain.	**$17,943.2**	**$20,991.1**	**$21,097.8**
Environmental Program & Management	$13,472.0	$14,922.2	$15,278.9
Science & Technology	$4,015.2	$4,241.2	$3,991.2
State and Tribal Assistance Grants	$456.0	$1,827.7	$1,827.7
Total Workyears	**1,794.8**	**1,830.7**	**1,820.0**

Objective 1: Attain NAAQS

Reduce the risk to human health and the environment by protecting and improving air quality so that air throughout the country meets national clean air standards by 2005 for carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead; by 2012 for ozone; and by 2018 for particulate matter (PM). To accomplish this in Indian country, the tribes and EPA will, by 2005, have developed the infrastructure and skills to assess, understand, and control air quality and protect Native Americans and others from unacceptable risks to their health, environment, and cultural uses of natural resources.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$1,264.2	$0.0	$0.0	$0.0
Air,State,Local and Tribal Assistance Grants: Other Air Grants	$185,647.6	$199,966.5	$193,466.5	($6,500.0)
Carbon Monoxide	$4,062.3	$4,258.4	$4,025.1	($233.3)
Congressionally Mandated Projects	$21,903.7	$14,492.5	$0.0	($14,492.5)
EMPACT	$1,797.9	$0.0	$0.0	$0.0
Facilities Infrastructure and Operations	$20,363.1	$18,978.9	$19,198.2	$219.3
Homeland Security	$0.0	$1,120.5	$0.0	($1,120.5)
Lead	$329.5	$342.2	$339.6	($2.6)
Legal Services	$5,145.8	$5,487.3	$5,973.1	$485.8
Management Services and Stewardship	$3,572.1	$4,395.3	$4,568.7	$173.4
Nitrogen Oxides	$1,379.4	$1,325.5	$1,399.0	$73.5
Ozone	$68,106.3	$68,455.1	$77,498.8	$9,043.7
Particulate Matter	$55,617.3	$52,302.7	$62,624.3	$10,321.6
Particulate Matter Research	$65,457.3	$65,468.2	$66,662.0	$1,193.8
Regional Haze	$2,305.9	$2,535.9	$2,408.1	($127.8)
Regional Management	$252.6	$349.5	$310.1	($39.4)
Sulfur Dioxide	$12,158.1	$12,318.5	$13,624.7	$1,306.2
Tropospheric Ozone Research	$6,551.0	$6,514.8	$6,758.1	$243.3

Annual Performance Goals and Measures

Reduce Ozone and Ozone Precursors

In 2003 Maintain healthy air quality for 44.1 million people living in monitored areas attaining the ozone standard; certify that 2 areas of the remaining 45 nonattainment areas have attained the 1-hour NAAQS for ozone thus increasing the number of people living in areas with healthy air by 1.0 million.

In 2002 Maintain healty air quality for 41.7 million people living in monitored areas attaining the ozone standard; certify 10 areas of the remaining 55 nonattainment areas have attained the 1-hour NAAQS for ozone, thus increasing the number of people living in areas with healthy air by 2.5 million.

In 2001 EPA maintained healthy air quality for 38.2 million people living in 43 areas attaining the ozone standard, increased by 3.5 million the number of people living in areas with healthy air quality that have newly attained the standard by certifying that 3 new areas have attained the 1-hour standard.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Total Number of People who Live in Areas Designated to Attainment of the Clean Air Standards for Ozone	41,679,000	44,146,000	45,167,000	People
Areas Designated to Attainment for the Ozone Standard	3	10	2	Areas
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the Ozone Standard	3,475,000	2,467,000	1,021,000	People
VOCs Reduced from Mobile Sources	1,659,000	1,755,000	1,852,000	Tons
NOx Reduced from Mobile Sources	1,189,000	1,319,000	1,449,000	Tons

Baseline: As a result of the Clean Air Act Amendments of 1990, 101 areas with a population of 140,015,000 were designated nonattainment for the 1-hour standard. Through 2001, 46 areas with a population of 41.7 million have been redesignated to attainment and 55 areas remain in nonattainment. (Population estimates based on 2000 census.) The 1995 baseline for VOCs reduced from mobile sources is 8,134,000 tons and 11,998,000 tons for NOx, both ozone precursors.

Reduce Particulate Matter

In 2003 Maintain healthy air quality for 7.2 million people living in monitored areas attaining the PM standards; increase by 81 thousand the number of people living in areas with healthy air quality that have newly attained the standard.

In 2002 Maintain healthy air quality for 3.4 million people living in monitored areas attaining the PM standards; increase by 3.7 million the number of people living in areas with healthy air quality that have newly attained the standard.

In 2001 EPA maintained healthy air quality for 1.189 million people living in 9 areas attaining the PM standards and increased by 2.249 million the number of people living in areas with healthy air quality that have newly attained the standard.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Total Number of People who Live in Areas Designated in Attainment with Clean Air Standards for PM	3,438,000	7,181,000	7,262,000	People
Areas Designated to Attainment for the PM-10 Standard	8	6	8	Areas

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Total Number of People who Live in Areas Designated in Attainment with Clean Air Standards for PM	3,438,000	7,181,000	7,262,000	People
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the PM Standard	2,249,000	3,743,000	81,000	People
PM-10 Reduced from Mobile Sources	22,000	23,000	25,000	Tons
PM-2.5 Reduced from Mobile Sources	16,500	17,250	18,000	Tons

Baseline: As a result of the Clean Air Act Amendments of 1990, 84 areas with a population of 31,114,000 were designated non-attainment for the PM-10 standard. Since that time, EPA has split Pocatella into 2 areas thereby revising the baseline to 85 with a population of 31,114,000. Through 2001, 17 areas with a population of 3.4 million have been redesignated to attainment. (Population estimates based on 2000 Census.) The 1995 baseline for PM-10 reduced from mobile sources is 880,000 tons and 659,000 for PM-2.5.

Reduce CO, SO2, NO2, Lead

In 2003 Maintain healthy air quality for 52.7 million people living in monitored areas attaining the CO, SO2, NO2, and Lead standards; increase by 4.1 million the number of people living in areas with healthy air quality that have newly attained the standard.

In 2002 Maintain healthy air quality for 36.7 million people living in monitored areas attaining the CO, SO2, NO2, and Lead standards; increase by 16 million, the number of people living in areas with healthy air quality that have newly attained the standard.

In 2001 EPA maintained healthy air quality for 36.3 million people living in 56 areas attaining the CO, SO2, NO2, and Lead standards and increased by 418,000 the number of people living in areas with healthy air quality that have newly attained the standard.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Total Number of People Living in Areas Designated in Attainment with Clean Air Standards for CO, SO2, NO2, and Pb	36,721,000	52,725,000	56,732,000	People
Areas Designated to Attainment for the CO, SO2, NO2, and Pb Standards	9	8	15	Areas
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the CO, SO2, NO2, and Pb Standards	418,000	16,005,000	4,007,300	People
CO Reduced from Mobile Sources	10,672,000	11,002,000	11,333,000	Tons
Total Number of People Living in Areas with Demonstrated Attainment of the NO2 Standard	14,944,000	14,944,000	14,944,000	People

Baseline: For SO2, NO2, Lead, and CO, 107 areas with a population of 67,573,000 were classified as non-attainment or were unclassified in 1990. Through 2001, 65 of those areas with a population of 36.7 million have been redesignated to attainment. (Population estimates based on 2000 census.) The 1995 baseline for mobile source emissions for CO was 70,947,000 tons.

Air Quality Index

In 2003 The three year average of the total number of days nationwide that any city reports air quality index (AQI) values greater than 100 in the nation's 94 largest metropolitan areas will drop from 1,548 in 1997-1999 to 1,290 in 2001-2003, which is 3.7% of total days.

In 2002 The three year average of the total number of days nationwide that any city reports air quality index (AQI) values greater than 100 in the nation's 94 largest metropolitan areas will drop from 1,548 in 1997-1999 to 1,390 in 2000-2002, which is 4.0% of total days.

In 2001 Three year trend data not available until late 2002.

Performance Measures:	**FY 2001 Actual**	**FY 2002 Enacted**	**FY 2003 Request**	**Units**
Number of Area Days Greater than 100	Data Lag	1,390	1,290	Area Days

Baseline: The AQI provides information on pollutant concentrations for ground level ozone (O3), particulate matter (PM-10), carbon monoxide (CO), sulfur dioxide (SO2), and nitrogen dioxide (NO2). Of these 5 pollutants, only 4 (CO, O3, PM-10, and SO2) generally contribute to the AQI value. Ozone contributes 98% of the AQI days over 100 due to ozone in 1999. The proposed measure is a three year running average of the total metropolitan statistical area days (msa-days) above an AQI value of 100. This averaging helps to account for the variability (upward and downward swings) associated with the significant effect of meteorology on this metric. Since 1993, the running 3 year average of AQI msa-days > 100 has fluctuated with a high of 1,586 for 1993-1995, a low of 1,414 for 1997-1999 and the mean of the average number of msa-days from the three year periods 1991-1993 through 1998-2000 at 1,490. This is a new measure for 2003, EPA will use the mean for the previous 7 three year periods (1,490) as its estimate for 2001 and targeted a reduction of 100 total msa-days each year through 2003.

Research

PM Effects Research

In 2003 Describe health effects of PM and its components in normal and susceptible populations, mechanisms by which PM exerts adverse health effects, and analyze ambient and personal exposure to PM so that EPA has the necessary information to develop NAAQS that protect human health.

In 2002 Provide data on the health effects and exposure to particulate matter (PM) and provide methods for assessing the exposure and toxicity of PM in healthy and potentially susceptible subpopulations to strengthen the scientific basis for reassessment of the NAAQS for PM.

In 2001 EPA provided new information on the atmospheric concentrations, human exposure, health effects and mechanisms of toxicity of particulate matter.

Performance Measures:	**FY 2001 Actual**	**FY 2002 Enacted**	**FY 2003 Request**	**Units**
Complete PM longitudinal panel study data collection and report exposure data.	1			study
Report on health effects of concentrated ambient PM in healthy animals and humans, in asthmatic and elderly humans, and in animal models of asthma and respiratory infection.	1			report
Final PM Air Quality Criteria Document completed.	0			final AQCD
Report on the effects of concentrated ambient PM on humans and animals believed most susceptible to adverse effects (e.g., elderly, people with lung disease, or animal models of such diseases).		1		report

Publish report on effects of particulate matter and volatile organic chemical air pollutants on children.		1		report
Publish report on the empirical and theoretical lung deposition dose of ultrafine, fine, and coarse particles in elderly and mild asthmatic subjects under various breathing conditions.			1	report
Publish report on the toxic effects of metallic and ultrafine PM constituents on lung cells and animals, and the molecular and biochemical mechanisms through which they occur.		1		report
Publish report on a series of studies of model and ambient PM effects in animal models of systemic hypertension, advanced cardiovascular disease, and chronic lung disease (asthma, COPD).		1		report
Report on animal and clinical toxicology studies using Utah Valley particulate matter (UVPM) to describe biological mechanisms that may underlie the reported epidemiological effects of UVPM.		1		report
Longitudinal PM exposure panel study final report.		1		report
Complete 3rd External Review Draft for the PM AQCD for public comment and CASAC review.		1 draft		report
Report on statistical associations of mortality/morbidity with source categories and other alternative indicators of PM exposure.		1		report
Capstone report on the physical, chemical, and toxicological characteristics of PM from heavy oil and coal combustion. The report provides data on the linkage between emissions and health effects.		1		report
Describe the relative importance of PM attributes (physical, chemical, and biological) on health outcomes in laboratory animals and humans.			1	evaluation
Ascertain attributes of susceptibility contributing to the responsiveness of cardiovascular- and pulmonary-compromised humans and laboratory animals.			1	analysis
Describe biochemical and neurogenic mechanisms by which PM modulates cardiovascular, hematological, and pulmonary functions.			1	evaluation
Report on the acute respiratory health effects of particulate matter and co-pollutants among asthmatic children in seven U.S. communities.			1	report

Baseline: At present, there is substantial evidence from epidemiological studies that increased levels of particulate matter (PM) are associated with increased frequency of death and disease, especially in the elderly, in individuals with cardiopulmonary disease, and in children. We still do not understand which PM components are responsible for increased mortality and morbidity, nor do we fully understand whether personal exposure to PM is reflective of exposure information obtained from fixed site monitoring. Our understanding of the biological mechanisms underlying these associations, and a fuller understanding of populations which may be susceptible to PM are also only now beginning to emerge. As noted by the National Research Council, the EPA research program is well targeted to address these critical knowledge gaps and is well integrated with the extensive ambient air monitoring programs managed by state and local agencies. The results of the research efforts in 2003 will include development and application of new methods for assessing human exposure, identifying susceptible populations and major PM components responsible for toxicity, and characterizing mechanisms of toxicity leading to PM health effects, all of which will yield an improved scientific basis for setting National Ambient Air Quality Standards (NAAQS) for PM.

PM Measurement Research

In 2003 Provide updated data on PM source emissions, technology costs and performance, and air quality models so that States will have improved PM emissions inventories and compliance strategies for attaining the PM NAAQS and safeguarding public health.

In 2001 Provided new information on particulate matter source emissions, measurements, methods, and emissions-based air quality models to guide State Implementation Plan (SIP) development under the PM NAAQS.

Performance Measures:	**FY 2001 Actual**	**FY 2002 Enacted**	**FY 2003 Request**	**Units**
Publish a report on the size distribution of particles emitted from diesel trucks under various on-road conditions to improve source inventories for NAAQS implementation.	1			report
Publish peer reviewed documentation of the PM components of Models-3/CMAQ.	1			documentation
Prepare a report evaluating a new PM control technology, electrostatic fabric filtration, for use on coal-fired boilers.			1	report
To support the OAR PM regulatory program, produce a paper on emissions of ammonia from hog waste lagoons, both before and after application of mitigation techniques.			1	paper
Complete analysis of organic compounds in PM samples from combustion sources. Data will be used to update an OAR database used by states to determine sources of ambient PM.			1	compendium

Baseline: There are existing databases, measurement methods, models, and other tools used to support decisions concerning implementation of the NAAQS for PM. Recent scientific advances and proposed changes to the PM standard require additional research to update and validate the existing tools and to develop new tools. While much is known about the emissions and concentrations of sulfur oxides and nitrogen oxides that contribute to formation of PM in the ambient air, less is known about other variables such as emissions of ammonia and directly emitted PM, how to measure the organic and elemental fractions of PM, and the myriad atmospheric reactions that lead to PM formation. Improvements are needed to measure various PM components at high time resolution and better specificity and to determine the physical properties of PM including size fractions and composition in ambient monitoring networks. Improvements are also needed to better understand the effect of meteorological parameters and other factors that may bias the measurements. Studies to validate and upgrade emission based and receptor models are also needed to ensure these tools produce the best results possible to support NAAQS compliance decisions. Key needs include studies to validate PM concentrations generated by the model against actual field measurements, improved data on the composition of directly emitted PM to identify unique tracers that relate emissions from a specific source, and improvements in our understanding of PM formation in clouds and fogs and transport processes at the surface and aloft to upgrade model algorithms that calculate atmospheric PM formation. Finally, as new PM and multi-pollutant control technologies are developed, technical and economic assessments are needed to assess their viability. Federal, state, and local air quality officials will use the upgraded models, methods and other tools to design and implement existing and new PM and visibility standards.

Verification and Validation of Performance Measures

Performance Measures: NAAQS
- **Areas Designated for the 1-hour Ozone Standard and Associated Populations**
- **Areas Redesignated/ Areas Maintaining Healthful Standards for CO, SO2, NO2, and Lead and Associated Populations**
- **Areas Designated for PM 10 Standard and Associated Populations**

Performance Databases:
- AIRS- Aerometric Information Retrieval System is comprised of two major subsystems: 1) the Air Quality Subsystem (AQS) stores ambient air quality data (used to determine whether nonattainment areas have the three years of clean air data

needed for redesignation), and 2) the Airs Facility Subsystem (AFS) stores emissions and compliance/enforcement information for facilities.

- FREDS-The Findings and Required Elements Data System is used to track progress of states and regions in reviewing and approving the required data elements of the State Implementation Plans (SIP). SIPs define what actions a state will take to improve the air quality in areas that do not meet national ambient air quality standards.

Data Source:

- AIRS: State and local agency data from State and Local Air Monitoring Stations (SLAMS).

- FREDS: Data are provided by EPA's Regional offices.

QA/QC Procedures:

- AIRS: The Quality Assurance and Quality Control (QA/QC) of the national air monitoring program have several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews. To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and siting criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and recordkeeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections.

- FREDS: No formal QA/QC procedures.

Data Quality Review:

- AIRS: No external audits have been done in the last 3 years.

- FREDS: None.

Data Limitations:

- AIRS: Potential data issues: 1) incomplete or missing data (e.g., some values may be absent due to incomplete reporting, and some values subsequently may be changed due to quality assurance activities); 2) inaccuracies due to imprecise measurement and recording (e.g., faulty monitors; air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area); and 3) inconsistent or non-standard methods of data collection and processing (e.g., non-calibrated and non-operational monitors).

- FREDS: Potential data issue is incomplete or missing data from Regions.

Data issues are all subject to the QA/QC procedures listed above and therefore are resolved or accounted for depending on how the data will be used.

New/Improved Data or Systems:

- AIRS: AQS, which stores ambient air quality data from over 5000 sites across the country, is a user-friendly, Windows-based Oracle relational database. State and local agencies routinely upload air quality data to AQS on a quarterly basis, which the public can access through the web. Fiscal Year 2002 efforts will begin the process of moving AQS from a client-server application to a web application, allowing agencies to submit data to AQS via the Agency's Central Data Exchange (CDX). AFS, a mainframe system that the Office of Air Quality Planning and Standards (OAQPS) used for many years for managing its national emissions database has been replaced by the National Emissions Trends (NET) database. NET is an ORACLE database accessible through the Internet. Both systems will be enhanced to include the data standards (*e.g.,* latitude/longitude, chemical nomenclature) developed under the Agency's Reinventing Environmental Information (REI) Initiative. Facility identification standards will be included so that air emission data in the NET database can be linked with environmental data in other Agency databases for the same facility.

- FREDS: None

Performance Measure: Reductions in Mobile Source VOC Emissions and Reduction in Mobile Source NOx Emissions

Performance Database: AIRS

Data Source: AIRS: State and local agency data from State and Local Air Monitoring Stations (SLAMS).

QA/QC Procedures: AIRS: The Quality Assurance and Quality Control (QA/QC) of the national air monitoring program have several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, the precision and accuracy of the collected data, EPA's National Performance Audit Program (NPAP), system audits, and network reviews. To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and siting criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and recordkeeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections.

Data Quality Review: AIRS: No external audits have been done in the last 3 years.

Data Limitations: AIRS: Some potential issues: 1) incomplete or missing data (*e.g.,* some values may be absent due to incomplete reporting, and some values subsequently may be changed due to quality assurance activities); 2) inaccuracies due to imprecise measurement and recording (*e.g.,* faulty monitors; air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area); and 3) inconsistent or non-standard methods of data collection and processing (*e.g.,* non-calibrated and non-operational monitors).

Data issues are all subject to the QA/QC procedures listed above and therefore are resolved or accounted for depending on how the data will be used.

EPA does make estimates of mobile source emissions, for both past and future years. The most complete and systematic process for making and recording such estimates is the "Trends" inventory process executed each year by OAQPS's Emissions, Monitoring, and Analysis Division (EMD). The Assessment and Modeling Division is the coordinator within the Office of Transportation and Air Quality for providing EMD information and methods for making the mobile source estimates. In addition, EMD's contractors obtain some necessary information directly from other sources; for example, weather data and the Federal Highway Administration's (FHWA) Vehicle Miles Traveled (VMT) estimates by state. EMD always creates and publishes the emission inventory estimate for the most recent historical year, detailed down to the county level and with 31 line items representing mobile sources. Usually, EMD also creates estimates of emissions for future years. When the method for estimating emissions changes significantly, EMD usually revises its older estimates of emissions in years prior to the most recent year, to avoid a sudden discontinuity in the apparent emissions trend. EMD publishes the national emission estimates in hardcopy; county-level estimates are available electronically.

It is useful to understand just what mobile source information is updated in Trends each year. An input is updated annually only if there is a convenient source of annual data for the input. Generally, VMT, the mix of VMT by type of vehicles (FHWA types, not EPA types, however), temperatures, gasoline properties, and the designs of Inspection/Maintenance (I/M) programs are updated each year. The age mix of highway vehicles is updated, using state registration data; this captures the effect of fleet turnover, assuming emission factors for older and newer vehicles are correct. Emission factors for all mobile sources and activity estimates for non-road sources are changed only when Office of Transportation and Air Quality requests that this be done and is able to provide the new information in a timely manner.

The limitations of the inventory estimates for mobile sources come~~s~~ from limitations in the modeled emission factors in grams per mile (g/mile) and also the estimated vehicle miles traveled for each vehicle class. For nonroad emissions, the estimates come from a model using equipment populations, emission factors per hour or unit of work, and an estimate of usage. These input data are frequently revised with newer data. Any limitations in the input data such as emission factors (based on emission factor testing and models predicting overall fleet emission factors such as in g/mile), vehicle miles traveled (which are derived from Department of Transportation data), and other factors will carry over into limitations in the emission inventory estimates.

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Performance Measure: Reductions in Mobile Source PM 10 Emissions and PM 2.5 Emissions

Performance Database: AIRS

Data Source: AIRS: State and local agency data from State and Local Air Monitoring Stations (SLAMS).

QA/QC Procedures: AIRS: The QA and QC of the national air monitoring program have several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, the precision and accuracy of the collected data, EPA's National Performance Audit Program (NPAP), system audits, and network reviews. To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and siting criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and record keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections.

Data Quality Review: AIRS: No external audits have been done in the last 3 years.

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Data issues are all subject to the QA/QC procedures listed above and therefore are resolved or accounted for depending on how the data will be used.

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has been replaced by the National Emissions Trends (NET) database. NET is an ORACLE database accessible through the Internet. Both systems will be enhanced to include the data standards (*e.g.,* latitude/longitude, chemical nomenclature) developed under the Agency's Reinventing Environmental Information (REI) Initiative. Facility identification standards will be included so that air emission data in the NET database can be linked with environmental data in other Agency databases for the same facility.

Statutory Authorities

Clean Air Act (42 U.S.C. 7401-7671q)
Motor Vehicle Information and Cost Savings Act and Alternative Motor Fuels Act of 1988 (AFMA)
National Highway System Designation Act

Research

Clean Air Act (CAA) (42U.S.C 7401-7661q)

Objective 2: Reduce Air Toxics Risk

By 2020, eliminate unacceptable risks of cancer and other significant health problems from air toxic emissions for at least 95 percent of the population, with particular attention to children and other sensitive subpopulations, and substantially reduce or eliminate adverse effects on our natural environment. By 2010, the tribes and EPA will have the information and tools to characterize and assess trends in air toxics in Indian country.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$185.5	$0.0	$0.0	$0.0
Air Toxics Research	$19,077.0	$18,923.4	$19,883.7	$960.3
Air,State,Local and Tribal Assistance Grants: Other Air Grants	$29,877.0	$30,790.4	$37,290.4	$6,500.0
Congressionally Mandated Projects	$3,161.7	$4,095.0	$0.0	($4,095.0)
EMPACT	$309.7	$0.0	$0.0	$0.0
Facilities Infrastructure and Operations	$4,288.9	$5,430.0	$5,249.3	($180.7)
Hazardous Air Pollutants	$53,290.2	$52,225.3	$52,622.4	$397.1
Homeland Security	$0.0	$353.5	$0.0	($353.5)
Legal Services	$1,462.7	$1,552.6	$1,713.0	$160.4
Management Services and Stewardship	$620.1	$1,288.7	$1,264.4	($24.3)

Annual Performance Goals and Measures

Reduce Air Toxic Emissions

In 2003 Air toxics emissions nationwide from stationary and mobile sources combined will be reduced by an additional 3% of the updated 1993 baseline of 6.1 million tons (for a cumulative reduction of 40% from the 1993 level of 6.1 million tons per year.)

In 2002 Air toxics emissions nationwide from stationary and mobile sources combined will be reduced by 5% from 2001 (for a cumulative reduction of 40% from the 1993 level of 4.3 million tons per year.)

In 2001 End-of-year FY 2001 data will be available in late 2004 to verify that air toxics emissions nationwide from stationary and mobile sources combined will be reduced by 5% from 2000 (for a cumulative reduction of 35% from the 1993 level of 4.3 million tons.)

Performance Measures:	**FY 2001 Actual**	**FY 2002 Enacted**	**FY 2003 Request**	**Units**
Combined Stationary and Mobile Source Reductions in Air Toxics Emissions	5	5	3	Percent
Federal Register Publication of Final MACT Standards	4	13	19	Notices
Number of proposed MACT standards.	13	15	9	Proposed

Baseline: In 1993, the last year before the MACT standards and mobile source regulations developed under the Clean Air Act were implemented, stationary and mobile sources are now estimated to have emitted 6.1 million tons of air toxics. (EPA's prior estimate was 4.3 million tons.) Air toxics emission data are revised every three years to generate inventories for the National Toxics Inventory. Reductions are estimated from regulatory controls in the years between the three year updates. Using revised inventories and improved models, the estimate has been revised up from the previous estimate of 4.3 million tons.

Verification and Validation of Performance Measures

Performance Measure: Combined Stationary and Mobile Source Reductions in Air Toxics Emissions

Performance Database: National Toxics Inventory (NTI)

Data Source: The NTI includes emissions from large industrial or point sources, smaller stationary area sources, and mobile sources. The baseline NTI (for base years 1990 - 1993) includes emissions information for 188 hazardous air pollutants from more than 900 stationary sources. It is based on data collected during the development of Maximum Achievable Control Technology (MACT) standards, state and local data, Toxics Release Inventory (TRI) data, and emissions estimates using accepted emission inventory methodologies. The 1996 and the 1999 NTI contain facility-specific, non-point source, and mobile source estimates and are used as input to National Air Toxics Assessment (NATA) modeling. (ASPEN, a dispersion model, contributes to NATA modeling.) The primary source of data in the 1996 NTI is state and local data. The 1996 and 1999 state and local facility data are supplemented with data collected during the development of the MACT standards and TRI data.

QA/QC Procedures: Because the NTI is primarily a database designed to house information from other primary sources, most of the QA/QC efforts have been to identify duplicate data from the different data sources and to supplement missing data. When a discrepancy among data sources is found, EPA tries to determine the best primary source data. Mobile source data are validated by using speciated test data from the mobile source emission factor program, along with peer-reviewed models which estimate national tons for the relevant year.

Data Quality Review: EPA staff, state and local agencies, and industry have reviewed the NTI. To assist in the review of the 1999 NTI, the EPA provided a comparison of data from the 3 data sources (MACT, TRI, and state and local inventories) for each facility.

Data Limitations: The NTI contains data from other primary references. Because of the different data sources, not all information in the NTI has been compiled using identical methods. Also, for the same reason, there are likely some geographic areas with more detail and accuracy than others. Because of the lesser level of detail in the 1993 NTI, it is not suitable for input to dispersion models.

New/Improved Data or Systems: The 1996 and 1999 NTI are a significant improvement over the baseline NTI because of the added facility-level detail (e.g., stack heights, latitude/longitude locations, etc.), making it useful for dispersion model input. Future inventories (2002, and later years) are expected to improve significantly because of increased interest in the NTI by regulatory agencies, environmental interests, and industry, and the greater potential for modeling and trend analysis.

Statutory Authorities

Clean Air Act Title I, Part A and Part D, Subparts 3 and 5 (42 U.S.C. 7401-7431, 7512-7512a, 7514-7514a) (15 U.S.C. 2605)
Clean Air Act Amendments, Title II (42 U.S.C. 7521-7590)
Clean Air Act Amendments, Title IV (42 U.S.C. 7651-7661f)

Research
Clean Air Act (CAA) (42 U.S.C. 7401-7671q)

Objective 3: Reduce Acid Rain

By 2005, reduce ambient nitrates and total nitrogen deposition to 1990 levels. By 2010, reduce ambient sulfates and total sulfur deposition by up to 30 percent from 1990 levels.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Acid Rain -CASTNet	$3,991.2	$3,991.2	$3,991.2	$0.0
Acid Rain -Program Implementation	$12,248.7	$12,500.2	$12,790.4	$290.2
Administrative Services	$170.0	$0.0	$0.0	$0.0
Air,State,Local and Tribal Assistance Grants: Other Air Grants	$4,060.0	$1,827.7	$1,827.7	$0.0
Congressionally Mandated Projects	$249.4	$250.0	$0.0	($250.0)
Facilities Infrastructure and Operations	$0.0	$1,311.3	$1,292.6	($18.7)
Legal Services	$1,040.3	$834.7	$923.5	$88.8
Management Services and Stewardship	$135.6	$276.0	$272.4	($3.6)

Annual Performance Goals and Measures

Reduce SO2 Emissions

In 2003 Maintain or increase annual SO2 emission reduction of approximately 5 million tons from the 1980 baseline. Keep annual emissions below level authorized by allowance holdings and make progress towards achievement of Year 2010 SO2 emissions cap for utilities.

In 2002 Maintain or increase annual SO2 emission reduction of approximately 5 million tons from the 1980 baseline. Keep annual emissions below level authorized by allowance holdings and make progress towards achievement of Year 2010 SO2 emissions cap for utilities.

In 2001 End-of-year FY 2001 data will be available in late 2002 to verify that 2 million tons of NOx from coal-fired utility sources were reduced from levels that would have been emitted without implementation of Title IV of the Clean Air Act Amendments.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
SO2 Emissions	On track	5,000,000	5,000,000	Tons Reduced

Baseline: The base of comparison for assessing progress on the annual performance goal is the 1980 emissions baseline. The 1980 SO2 emissions inventory totals 17.5 million tons for electric utility sources. This inventory was developed by National Acid Precipitation Assessment Program (NAPAP) and used as the basis for reductions in Title IV of the Clean Air Act Amendments. This data is also contained in EPA's National Air Pollutant Emissions Trends Report. Statutory SO2 emissions cap for year 2010 and later is at 8.95 million tons which is approximately 8.5 million tons below 1980 emissions level. "Allowable SO2 emission level" consists of allowance allocations granted to sources each year under several provisions of the Act and additional allowances carried over, or banked, from previous years.

Reduce NOx Emissions

In 2003 2 million tons of NOx from coal-fired utility sources will be reduced from levels that would have been emitted without implementation of Title IV of the Clean Air Act Amendments.

In 2002 2 million tons of NOx from coal-fired utility sources will be reduced from levels that would have been emitted without implementation of Title IV of the Clean Air Act Amendments.

In 2001 End-of-year FY 2001 data will be available in late 2002 to verify that NOx emissions during ozone season from participating utility and industrial sources were below allowable level authorized by allowance (approximately 50% reduction from 1990 baseline).

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Untis
NOx Reductions	On track	2,000,000	2,000,000	Tons Reduced

Baseline: Performance Baseline: The base of comparison for assessing progress on this annual performance goal is emissions that would have occurred in the absence of Title IV of the Clean Air Act Amendments. These emissions levels are calculated using actual annual heat input and the baseline (uncontrolled) NOx emission rates by boiler type from the preamble to the final rule (61 FR 67112, December 19, 1996).

Reduce Ozone Season NOx Emissions

In 2003 Control NOx emissions during ozone season from participating utility and industrial sources to below allowable level authorized by allowances.

In 2002 Control NOx emissions during ozone season from participating utility and industrial sources to below allowable level authorized by allowances.

In 2001 End-of-year FY 2001 data will be available in late 2002 to verify that NOx emissions during ozone season from participating utility and industrial sources were below allowable level authorized by allowance (approximately 50% reduction from 1990 baseline).

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Ozone Season NOx Reductions	Data Lag	220,000	220,000	Tons Reduced

Baseline: Performance Baseline: The base of comparison for assessing performance on annual performance goals is the 1990 emissions baselines adopted in the state rules. The ozone season is 5 months long, May 1 to September 30. "Allowable NOx emissions level" is defined by the sum of allowance allocations authorized by various provisions in enabling state rules and allowances carried over, or banked, from previous years discounted by the Progressive Flow Control ratio. An allowance authorizes a source to emit one ton of NOx during the ozone season.

Verification and Validation of Performance Measures

Performance Measure: SO_2 and NO_X emission reductions

Performance Database: Emissions Tracking System (ETS), SO_2 and NO_X emissions collected by Continuous Emission Monitoring Systems (CEMS), CASTNet (dry deposition), National Atmospheric Deposition Program (NADP) (wet deposition)

Data Source:

- On a quarterly basis ETS receives hourly measurements of SO_2, NO_x, volumetric flow, CO_2, and other emission-related parameters from more than 2,000 units affected by Title IV.

- CASTNet measures particle and gas acidic deposition chemistry. Specifically, CASTNet measures sulfate and nitrate dry deposition and meteorological information at approximately 70 active monitoring sites. CASTNet is primarily an eastern, long-term dry deposition network funded, operated and maintained by EPA's Office of Air and Radiation (OAR).

- NADP is a national long-term wet deposition network that measures precipitation chemistry and provides long-term geographic and temporal trends in concentration and deposition of major cations and anions. Specifically, NADP provides measurements of sulfate and nitrate wet deposition at approximately 200 active monitoring sites. EPA, along with several other federal agencies, states, and other private organizations, provides funding and support for NADP. The Illinois State Water Survey/University of Illinois maintains the NADP database.

QA/QC Procedures:

- QA/QC requirements dictate performing a series of quality assurance tests of CEMS performance. For these tests, emissions data are collected under highly structured, carefully designed testing conditions, which involve either high quality standard reference materials or multiple instruments performing simultaneous emission measurements. The resulting data are screened and analyzed using a battery of statistical procedures, including one that tests for systematic bias. If CEMS fails the bias test, indicating a potential for systematic underestimation of emissions, either the problem must be identified and corrected or the data are adjusted to minimize the bias.

- CASTNet has established data quality objectives and quality control procedures for accuracy and precision.

- NADP has established data quality objectives and quality control procedures for accuracy, precision and representativeness. The intended use of these data is to establish spatial and temporal trends in wet deposition and precipitation chemistry.

Data Quality Review:

- The ETS provides instant feedback to sources to identify any data reporting problems.

- EPA staff then conduct data quality review on each quarterly ETS file. In addition, states or EPA staff conduct random audits on selected sources' data submission.
- CASTNet recently underwent formal Agency peer review by an external panel.

- NADP methods of determining wet deposition values have undergone extensive peer review, handled entirely by the NADP housed at the Illinois State Water Survey/University of Illinois. Assessments of changes in NADP methods are developed primarily through the academic community and reviewed through the technical literature process.

Data Limitations: None

New/Improved Data or Systems: In order to improve the spatial resolution of the Network (CASTNet), additional monitoring sites are needed.

Statutory Authorities

Clean Air Act Amendments, Title I (42 U.S.C. 7401-7514a)
Clean Air Act Amendments, Title IV (42 U.S.C. 7651-7661f)
Clean Air Act Amendments, Title IX (42 U.S.C. 7403-7404)